

U.S. Application No. 09/311,996  
Attorney Docket Number 09367.0052-00000

**IN THE CLAIMS**

This listing of claims will replace all prior versions, and listings, of claims in the application.

1-48. (Cancelled)

49. (Currently Amended) A computer program product for determining a property of a manipulation based upon determination of effects of said manipulation on a plurality of different cell types, said computer program product comprising:

code for receiving one or more images of a plurality of components of a plurality of cells, wherein said plurality of cells are of different cell types and wherein said plurality of cells have been exposed to the manipulation;

code for determining a plurality of features of said plurality of components of said plurality of cells of different cell types;

code for ~~combining~~ analyzing said plurality of features to yield a plurality of descriptors, wherein some of said features are from a first cell type and some of said features are from a second cell type, and wherein some of said features from a first cell type are combined with features from a second cell type to yield one or more composite descriptors at least one of said plurality of descriptors is a composite descriptor resulting from the combination of features from cells of different cell types;

code for performing principal component analysis on said plurality of descriptors wherein at least one of said plurality of descriptors is a composite descriptor, whereby said descriptors are reduced to yield a fingerprint;

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code for determining properties of said manipulation based upon said principal component analysis; and  
a computer readable storage medium comprising said computer program product.

50. (Previously Presented) The computer program product of claim 49 wherein said plurality of components are selected from a protein, a protein modification, a nucleic acid, a lipid, a carbohydrate, a sub-cellular structure, and an organelle.

51. (Previously Presented) The computer program product of claim 49 wherein said manipulation comprises applying a chemical factor.

52. (Previously Presented) The computer program product of claim 49 wherein said property comprises toxicity.

53. (Previously Presented) The computer program product of claim 49 wherein said property comprises a mechanism of action.

54. (Previously Presented) The computer program product of claim 49 wherein said property comprises at least one of a plurality of pharmacological properties.

55. (Previously Presented) The computer program product of claim 54 wherein said pharmacological properties comprises at least of absorption, excretion, distribution, and metabolism.

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56. (Previously Presented) A computer program product comprising a machine readable medium on which is provided program instructions for determining an effect of a manipulation on a plurality of cells of different cell types, the instructions comprising:

code for receiving one or more images of a plurality of components of a plurality of cells, wherein said plurality of cells are of different cell types and wherein said plurality of cells have been exposed to the manipulation;

code for determining a plurality of features of said plurality of components of said plurality of cells of different cell types;

code for combining said plurality of features

wherein some of said features are from a first cell type and some of said features are from a second cell type, and

wherein some of said features from a first type are combined with features from a second cell type to yield one or more composite features; and

code for performing statistical analysis on said plurality of features wherein said statistical analysis comprises multidimensional representations, principal component analysis, or frequency based representations on at least said one or more composite features to determine the effect of the manipulation on the plurality of cells.

57. (Previously Presented) The computer program product of claim 56, wherein the manipulation is application of at least one of a chemical factor, a biological factor, an electromagnetic factor, a gravitational factor, a mechanical factor, a thermal factor, a temporal factor, and a nuclear factor.

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58. (Cancelled)

59. (Cancelled)

60. (Previously Presented) The computer program product of claim 56, wherein said first component is a protein, a protein modification, a nucleic acid, a lipid, a carbohydrate, a sub-cellular structure or an organelle.

61. (Previously Presented) The computer program product of claim 56, wherein the effect of the manipulation is at least one of the following: toxicity, specificity against a subset of tumors, a mechanism of chemical activity, a mechanism of biological activity, interaction with a target protein, an adverse biological effect, an adverse clinical effect, cellular availability, a pharmacological property, a gene expression profile, absorption, excretion, distribution, metabolism, and a pharmacodynamic effect.

62. (Cancelled)

63. (Previously Presented) A computer program product comprising a machine readable medium on which is provided program instructions for predicting properties of a chemical compound based on information about effects of at least one of a plurality of known compounds on a plurality of cells of different cell types, the instructions comprising:

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code for receiving one or more images of a plurality of components of a plurality of cells of different cell types that have been exposed to the chemical compound;

code for determining, from the one or more images, multiple descriptors for multiple components of the plurality of cells of said different cell lines,

wherein said code for determining a multiple descriptors comprises code for performing principal component analysis on the said multiple descriptors,

wherein said descriptors are determined for at least two different cell lines and

wherein at least some of said descriptors combine features from cells of different cell types;

code for determining a relationship between said descriptors of said chemical compound with other descriptors of said known compounds; and

code for making an inference about said chemical compound based upon said other descriptors,

wherein said descriptors and other descriptors comprise numeric or logical values.

64. (Previously Presented) The computer program product of claim 63, wherein the multiple components are independently selected from the group consisting of a protein, a protein modification, a nucleic acid, a lipid, a carbohydrate, a sub-cellular structure or an organelle.

65. (Previously Presented) The computer program product of claim 63, wherein the property that is being predicted is at least one of the following: toxicity, specificity against a subset of tumors, a mechanism of chemical activity, a mechanism of biological activity,

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interaction with a target protein, an adverse biological effect, an adverse clinical effect, cellular availability, a pharmacological property, a gene expression profile, absorption, excretion, distribution, metabolism, and a pharmacodynamic effect.

66. (Previously Presented) The computer program product of claim 49 wherein said manipulation is selected from the group consisting of applying a hormone, applying a growth factor, applying an extracellular matrix component, applying a virus, electroporation, applying an antisense polynucleotide, a gene knock-out, a gene overexpression, a gene mutation, a cell fusion, and combinations thereof